7.03 FORESTRY SCIENCES LIBRARY CHARLES A. WELLNER

SECOND GROWTH TIMBER

WORTH HOLDING IN

NORTHERN ROCKY MOUNTAIN REGION

FIG. 1. The first stage. Western white pine reproduction 15 years old, often called "brush."

Western White Pine Second Growth Is Worth Holding as an Investment

A great many ranchers and landowners in the western white-pine belt of northern Idaho and western Montana have some logged and burned-over land which seems to them to have little if any present value. Probably the land contains young second growth which has come in following the slash burn and which the owner rates as worthless brush. In some cases the fact may be recognized that these young trees will shortly make firewood, fence posts, and later on logs, if they can be saved from destruction by fire, but the cost of protection may seem too high when compared with the revenue that can be expected.

In a few cases, landowners who happen to know something about the story of second-growth northern white pine in New England or the Lake States realize that these young-growth stands of western white pine are well worth the cost of protection, even though the owners themselves may not live to see the trees reach saw-log size. These men probably are familiar with conditions in the east, where the so-called pine brush was treated with contempt 50 years ago, then left to grow because it was too expensive to remove, then

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

District 1 and Northern Rocky Mountain Experiment Station

MISSOULA, MONT.

U. S. GOVERNMENT PRINTING OFFICE: 1928 8—6601

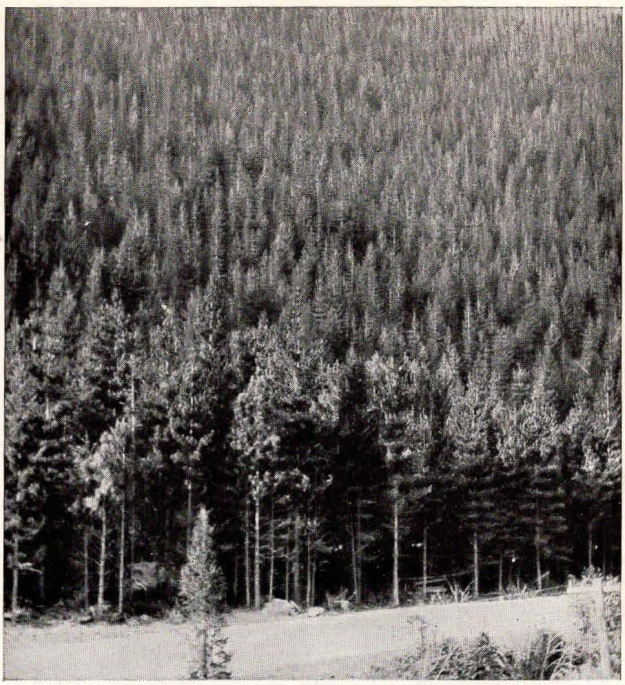


FIG. 2. The second stage. An excellent stand of good-sized 35-year-old western white pine near Larson, Idaho. Well developed toward merchantability.

appreciated as potential timber, and is now being logged at a profit. Men who saw these changes also often know of eastern farmers who planted northern white-pine seedlings at a cost of $12 or $15 an acre in 1920 or 1925 on land that they had laboriously cleared of "pine brush" in 1880 or 1890. In New England and the Lake States pine is now recognized as a valuable timber crop.

A Growing Stand of Young Timber is a Splendid Inheritance to Leave Your Sons and Daughters

A stand of western white pine 30 or 40 years old will bear a valuable crop of merchantable timber in another 30 or 40 years. If the present owner does not live to realize on it, the sale of a few hundred acres may mean a small fortune to his children. The annual growth of timber is like interest on money in the savings bank.

The owners of tracts of second growth often wish to know what growth they can expect from their acres of young timber, how big the trees will be 10, 20, or 30 years hence, how many trees per acre there should be, and how many board feet per acre may be expected at different ages. Knowing such facts they can more readily determine the expense that is justified in saving this tree growth for later sale.

The tables which follow are based on actual measurements, by the Northern Rocky Mountain Forest Experiment Station, of all the trees on 271 sample areas of western white pine located in various parts of northern Idaho and western Montana. They show very clearly that the better class western white pine forest lands in this region, which are often of low value for agricultural purposes, are producing large volumes of timber and that the increase in volume is so rapid as to be well worth considerable expenditure for protection.

FIG. 3. The third stage. A 70-year-old stand thinned for cordwood, leaving the ultimate crop trees (banded), and a good understory of cedar well established for an even later cutting. Near Priest River, Idaho. Some of these larger trees are of merchantable size.

The table which follows shows the yield per acre to be expected at different ages on different sites. The volumes shown are for all trees in the stand 8 inches and up in diameter at breast height.

Yields from Fully Stocked Western White Pine Stands in Idaho and Western Montana

Age of stand	Average volume in board feet per acre, Scribner Decimal C Log Rule			
	Poor site	Fair site	Good site	Excellent site
40 years	50	400	1,700	3,900
60 years	2,900	6,550	13,100	21,650
80 years	11,300	19,500	32,750	46,500
100 years	22,600	36,300	53,500	68,500

Average Heights

The average height of the tallest trees in an even-aged stand is the most workable index of the class of site or soil on which the timber is growing. For the above sites the average heights of the tallest trees are about as follows:

Age of stand	Height in feet			
	Poor site	Fair site	Good site	Excellent site
20 years	9	12	14	16
40 years	30	37	45	52
60 years	50	60	73	85
80 years	66	82	98	115
100 years	80	100	118	138

8—6601

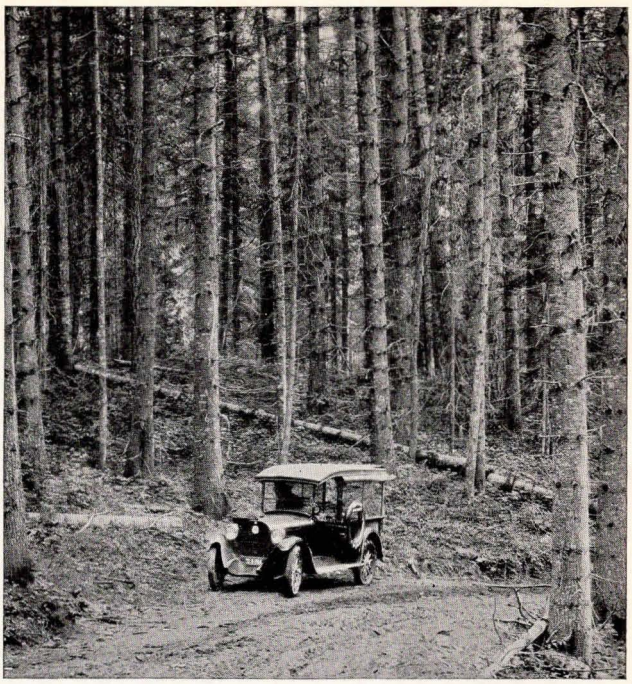


FIG. 4. The fourth stage. A dense stand of 100-year-old western white pine of great value. Near Pierce, Idaho.

Average Diameters

The average diameter of all trees in the stand over 7 inches in diameter, breast height, is as follows:

Age of stand	Diameter in inches			
	Poor site	Fair site	Good site	Excellent site
40 years	7	8	8	8
60 years	8	8	9	10
80 years	9	9	11	12
100 years	10	11	12	15

Large Yields Possible

The figures given in the table represent the growth that may be expected on what might be called the most common forest sites. Other areas were found which were poorer than the "poor site" shown, and some were found which were better than the "excellent site." On excellent sites in northern Idaho and western Montana yields of 8,250 feet at 40 years and 90,500 feet at 100 years are shown by the International log rule, which although not in use within this region is known to give more accurately than the Scribner rule the true board-foot volume of young stands. Almost all of the excellent sites are in private ownership, while the very poorest lands are generally at the highest elevations or near the limits of the range of western white pine and usually within the national or State forests.

These figures are furnished so that each owner of timberland can better determine the productive capacity of his land. They apply, however, only to fully stocked stands, i. e., those in which there are no gaps, holes, or fail spots bearing no trees. As nearly all timbered areas of two acres or more do have gaps in the stand, the possible yields as shown by the table must be reduced in proportion to the lack

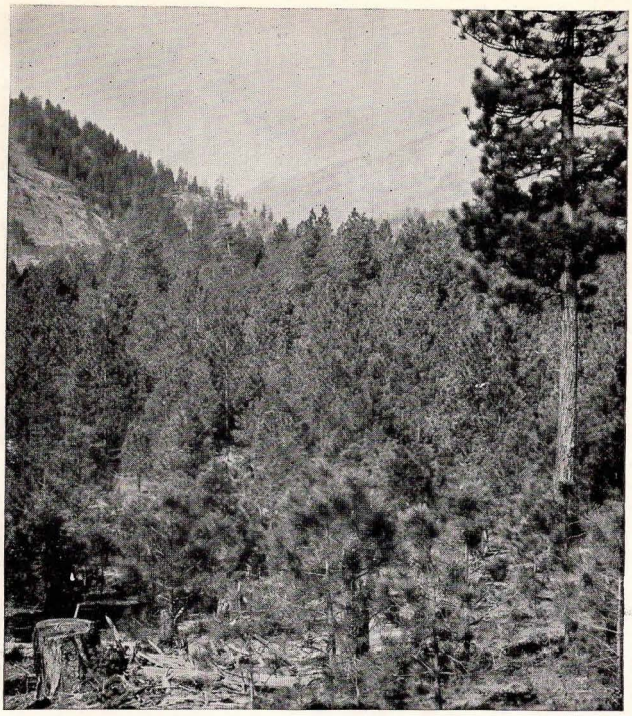


FIG. 5. Typical young growth of western yellow pine on land logged off about 18 years ago. Near Potomac, Mont.

of complete stocking. Thus, if an area bears only 75 per cent of the volume shown for full stocking, its future yields are arrived at by reducing the table volumes by 25 per cent. The average volume over large areas varying from light to heavy stocking has been found to be approximately 60 per cent of the volume shown in the table.

More detailed information in relation to any of the above statements will be furnished by the Northern Rocky Mountain Forest Experiment Station, Missoula, Mont., upon request.

Western Yellow Pine Second Growth Covers Large Areas in Idaho and Montana

At the lower timber line in northern Idaho and western Montana there are large areas covered with dense, fairly even-aged stands of second-growth western yellow pine (*Pondosa pine*), locally known as "bull pine," varying in age from a few years up to 40 or 50 years. These stands are found on some of the most easily accessible forest areas in the region, and are usually on land too poor to be profitably cleared and farmed, yet good enough to produce excellent timber growth. Because of their accessibility such lands may later be logged easily at a maximum profit if fire can be kept from damaging or eliminating the tree growth in the interval of time between youth and maturity.

Many local residents are beginning to realize the potential value of this young growth, which is rapidly reaching log size. In some cases, however, these young trees, already 20 to 40 years old, are being cut for cordwood, allowed to burn without protection, or slashed expensively in the hope that the land can be used profitably for agriculture. In many cases this young growth would be protected with great care if the owner appreciated the value already on hand and the much greater value obtainable if the trees were grown to log size.

8—6601

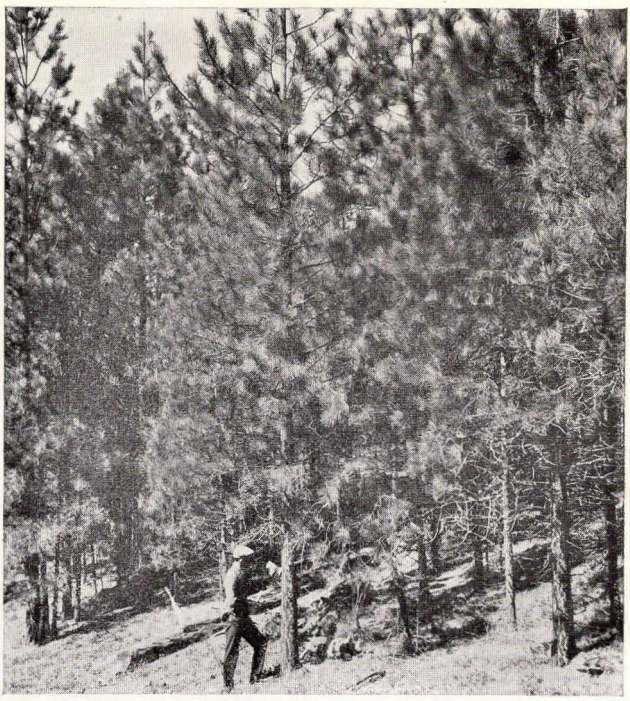


FIG. 6. Thrifty stands of second-growth western yellow pine like this are found extensively in Idaho and Montana. The stand here shown is about 35 years old.

When these dense stands of young timber are purposely slashed or stumped so that the land can be used for agriculture, the owner often neglects to consider that the future products from this area must compete with those from better lands naturally free from timber. The products from the forest land, therefore, must pay interest on a high cost value per acre of soil that is often less fertile than the nonforest land, and is often farther removed from roads and markets. On such lands the forest may prove to be the more profitable crop.

Western Yellow Pine Grows Rapidly in This Region

The following tables for western yellow pine are based on measurements of actual stands made by the University of Idaho Forestry School and compiled in cooperation with the United States Forest Service. Indebtedness for their use here is gratefully acknowledged to the University of Idaho. The yields in this case were worked up only by the International log rule, which, however, gives the contents of logs much more nearly as they saw out in the mill than does the Scribner rule. These figures show very clearly that if young stands of western yellow pine are protected and properly handled the poor agricultural lands can yield a very appreciable revenue to their owners.

Yield from Fully Stocked Western Yellow Pine in Northern Idaho

Age of stand	Average volume in board feet per acre, International Log Rule, using ¼-inch saw kerf		
	Poor site	Fair site	Good site
40 years	2,120	6,580	12,900
60 years	7,330	17,100	28,400
80 years	12,500	26,100	39,300
100 years	17,700	33,200	48,100

8—6601

FIG. 7. A merchantable crop of western yellow pine somewhat over 100 years old, in western Montana. Protection of this area from fire has permitted the starting of an excellent stand of seedlings under the old trees.

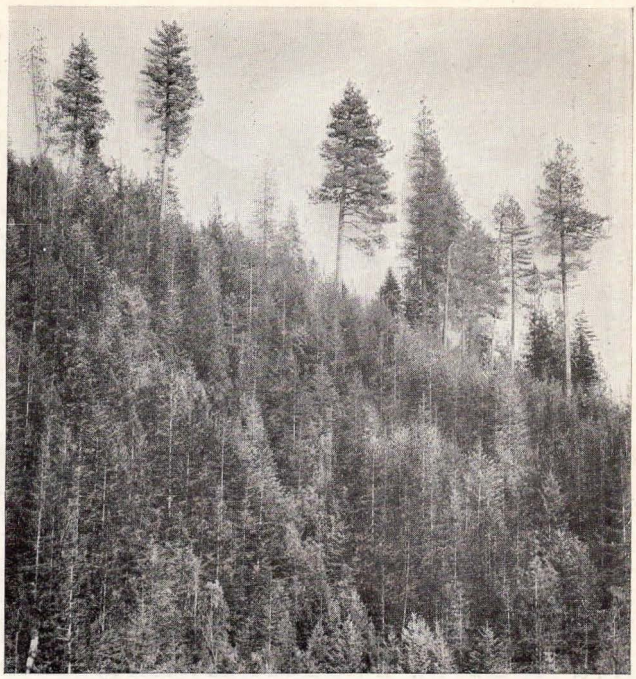
The average heights and average diameters for stands at different ages and sites are as follows:

Age of stand	Poor site		Fair site		Good site	
	Average diameter	Average height	Average diameter	Average height	Average diameter	Average height
	Inches	*Feet*	*Inches*	*Feet*	*Inches*	*Feet*
30 years	4	20	5	28	6	35
40 years	5	29	6	39	8	49
60 years	7	40	9	54	11	68
80 years	9	49	11	66	14	84
100 years	11	56	13	76	16	96

Protection from Fire Essential to Highest Yield and Value

As with the table showing western white-pine yields, the data in the western yellow-pine table apply only to fully stocked stands, where all the land is densely covered with tree growth. If the area bears only 75 per cent of the stand that would be present under full stocking, then the yields to be expected are only 75 per cent of those shown in the table.

It is in the reduction of stocking and the consequent lowering of later yields that fire is a most dangerous enemy of forestry. As is apparent in numerous stands in all parts of northern Idaho and western Montana, even a light, so-called "harmless" ground fire running through young pine kills many of the trees and leaves less timber than the land is capable of supporting. The remaining trees, those that escape one or more fires, are spaced farther apart than necessary. They produce limby stems and a smaller quantity and lower grade of lumber than would otherwise have been possible. Like a thin stand of wheat, a scattering of trees does not produce the best yield.



FIR. 8. There are thousands of acres of western larch and Douglas fir second growth like this in western Montana and northern Idaho.

For further information concerning methods of determining the site quality, the degree of stocking, etc., address the School of Forestry, Moscow, Idaho, the School of Forestry, Missoula, Mont., or the Northern Rocky Mountain Forest Experiment Station, Missoula, Mont.

Douglas Fir and Western Larch are Also Valuable Trees

Douglas fir and western larch or tamarack are commonly found in the northern Rocky Mountain region either in larch-fir stands or in mixture with western white pine and western yellow pine. Although larch and Douglas fir are less valuable at present for lumber than western white pine and western yellow pine, they are frequently found on the poorer quality forest land, which is usually much too poor for agricultural purposes. Hence, although other kinds of trees may be more valuable for sawn lumber, Douglas fir and larch make use of otherwise waste land and their rates of growth are such as to promise appreciable returns from this land.

These two species are specially valuable as a source of firewood in the northern Rocky Mountain region. A cord of 90 solid cubic feet of air-dry larch wood has a heat value equal to three-fourths of a short ton of coal, and a cord of air-dry Douglas fir is equal to six-tenths of a ton of coal. Hence these species can be thinned out from stands of western white and yellow pines, the more valuable pines being left for growth to log size, and a supply of valuable firewood being obtained as a by-product.

Both Douglas fir and western larch are mechanically stronger and more durable in contact with the ground than either the western white or western yellow pine. If the fir and larch have not been thinned out from the pine in young stands they can be removed before the pine is merchantable and used as fence posts, rails, and poles. Or they can be grown to a size suitable for railroad ties and small structural material, such as 2 x 4, 2 x 6, etc., which are always in demand. The ranch with its own supply of firewood and saw logs is almost always more valuable than the one without such materials.

8—6601